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EXAMINER

ROY, BAISAKHI

ART UNIT PAPER NUMBER

3737

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/064,756

Applicant(s)

BOYD ET AL.

Examiner

Baisakhi Roy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-33 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Toki et al. (5594772).

Regarding claims 1-3 and 13, Toki et al. disclose a method of obtaining cine angiography images with a computed tomography (CT) scanner (col. 1 lines 65-67, col. 2 lines 1-15 lines 55-67). The reference teaches the method of monitoring the cardiac cycle of the patient, selecting an independently configurable trigger array or various trigger points along the cycle, synchronizing data acquisition with the cardiac cycle, generating a CT scan upon synchronization of the cardiac cycle with the specific trigger array, and performing more than one such CT scan consecutively and beginning at different points within the time period to construct a cine angiography loop (col. 14 lines 36-67, col. 15 lines 14-67, col. 16 lines 1-13).

Regarding claims 4, 17, and 28, the reference teaches performing a scan in no more than 100 milliseconds (col. 10 lines 14-59).

Regarding claim 5, the reference teaches sweeping an electron beam across a target ring to perform said scans (col. 11 lines 1-10).

Regarding claim 6, the reference teaches utilizing an x-ray fan beam to perform said scans (col. 5 lines 44-46).

Regarding claims 7 and 8, the reference teaches combining a series of three dimensional images into a three dimensional cine loop based on more than one scan and further displaying a series of moving three dimensional images based on at least two CT scans (col. 7 lines 3-21).

Regarding claim 9, the reference teaches the method of gating the images to the specific phase of interest (col. 15 lines 14-59).

Regarding claims 10 and 11, the reference teaches moving the patient with respect to the CT scanner between or during the scans and further to obtain spiral scans (col. 3 lines 1-10, col. 5 lines 22-39 lines 66-67, col. 12 lines 42-52, col. 12 lines 24-26).

Regarding claim 12, the reference teaches the method of obtaining multiple parallel CT slices (col. 5 lines 57-67, col. 6 lines 44-48, col. 8 lines 4-21).

Regarding claims 14-16 and 24, Toki et al. teach the method of obtaining cine angiography images with a computed tomography (CT) scanner (col. 1 lines 65-67, col. 2 lines 1-15). The reference teaches the method of monitoring the cardiac cycle of the patient, selecting an independently configurable trigger array or various trigger points along the cycle, synchronizing data acquisition with the cardiac cycle, generating a CT scan upon synchronization of the cardiac cycle with the trigger array, sweeping an

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electron beam along a target, and performing more than one such CT scan consecutively and beginning at different points within a time period of two or more cardiac cycles to construct a cine angiography loop (col. 11 lines 1-10, col. 14 lines 36-67, col. 15 lines 14-67, col. 16 lines 1-13).

Regarding claims 18 and 19, the reference teaches combining a series of three dimensional images into a three dimensional cine loop based on more than one scan and further displaying a series of moving three dimensional images based on at least two CT scans (col. 7 lines 3-21).

Regarding claim 20, the reference teaches the method of gating the images to the specific phase of interest (col. 15 lines 14-59).

Regarding claims 21 and 22, the reference teaches moving the patient with respect to the CT scanner between or during the scans and further to obtain spiral scans (col. 3 lines 1-10, col. 5 lines 22-39 lines 66-67, col. 12 lines 42-52, col. 12 lines 24-26).

Regarding claim 23, the reference teaches the method of obtaining multiple parallel CT slices (col. 5 lines 57-67, col. 6 lines 44-48, col. 8 lines 4-21).

Regarding claims 25-27, Toki et al. teach the method of obtaining cine angiography images with a computed tomography (CT) scanner (col. 1 lines 65-67, col. 2 lines 1-15). The reference teaches the method of monitoring the cardiac cycle of the patient, selecting an independently configurable trigger array or various trigger points along the cycle, synchronizing data acquisition with the cardiac cycle, generating a CT scan upon synchronization of the cardiac cycle with the trigger array, performing more

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than one such CT scans consecutively and beginning at different points within a time period of two or more cardiac cycles to construct a cine angiography loop, and moving automatically the patient with respect to said CT scanner between or during at least two scans (col. 5 lines 22-39, col. 12 lines 16-26 lines 42-52, col. 14 lines 36-67, col. 15 lines 14-67, col. 16 lines 1-13).

Regarding claims 29 and 30, the reference teaches combining a series of three dimensional images into a three dimensional cine loop based on more than one scan and further displaying a series of moving three dimensional images based on at least two CT scans (col. 7 lines 3-21).

Regarding claim 31, the reference teaches the method of gating the images to the specific phase of interest (col. 15 lines 14-59).

Regarding claim 32, the reference teaches moving the patient with respect to the CT scanner between or during the scans and further to obtain spiral scans (col. 3 lines 1-10, col. 5 lines 22-39 lines 66-67, col. 12 lines 42-52, col. 12 lines 24-26).

Regarding claim 33, the reference teaches the method of obtaining multiple parallel CT slices (col. 5 lines 57-67, col. 6 lines 44-48, col. 8 lines 4-21).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heuscher et al. (6510337) in view of Sheehan et al. (5601084).

Regarding claims 1-3, 7, 8, and 13, Heuscher et al. disclose the method of obtaining cine angiography images with a computed tomography (CT) scanner. The reference teaches the method of monitoring the cardiac cycle of the patient, selecting various an independently configurable trigger array or various trigger points along the cycle, synchronizing data acquisition with the cardiac cycle, generating a CT scan upon synchronization of the cardiac cycle with the trigger array, and performing more than one such CT scan consecutively and beginning at different points within the time period to construct a video display of the motion of the beating heart (col. 1 lines 11-15, col. 2 lines 2-41, col. 4 lines 8-28, col. 7 lines 58-67, col. 8 lines 1-21 lines 36-45 lines 58-67). Heuscher et al. do not explicitly disclose constructing a cine loop from said CT scans. It is well known in the art to use a cine loop imaging method to model portions of the beating heart at different points in the cardiac cycle on a video display. In the same field of endeavor, Sheehan et al. disclose a method for constructing cine angiography images of the heart using a CT scanner with the synchronization of data acquisition with the cardiac cycle with said data being acquired a plurality of times during a cardiac cycle (abstract, col. 3 lines 1-19 lines 56-65, col. 7 lines 26-32, col. 9 lines 14-36, col. 10 lines 6-16). It would have therefore been obvious to one of ordinary skill in the art to use the cine CT imaging method teaching by Sheehan et al. to modify the teaching by Heuscher et al. for the purpose of displaying the series of CT scans on a video display into a three dimensional cine loop.

Regarding claims 4, 17, and 28, Heuscher et al. do not explicitly teach a scan speed. Sheehan et al. teach performing said scan in less than 100 milliseconds (col. 8 lines 51-55). It would have therefore been obvious to one of ordinary skill in the art to use the scan speed teaching by Sheehan et al. to modify the teaching by Heuscher et al. for the purpose of obtaining scans in less than 100 milliseconds.

Regarding claim 5, the reference teaches sweeping an electron beam across a target ring to perform said scans (col. 1 lines 11-15).

Regarding claim 6, the reference teaches utilizing an x-ray fan beam to perform said scans (col. 3 lines 49-57, col. 4 lines 1-7).

Regarding claim 9, the reference teaches the use of prospective gating (col. 8 lines 36-45 lines 60-67, col. 9 lines 1-3).

Regarding claims 10 and 11, the reference teaches moving the patient with respect to the CT scanner between or during the scans and further to obtain spiral scans (col. 3 lines 16-25).

Regarding claim 12, the reference teaches the method of obtaining multiple parallel CT slices (col. 3 lines 37-48).

Regarding claims 14-16, 18, 19 and 24, Heuscher et al. teach the method of obtaining cine angiography images with a computed tomography (CT) scanner. The reference teaches the method of monitoring the cardiac cycle of the patient, selecting independently configurable trigger array or various trigger points along the cycle, synchronizing data acquisition with the cardiac cycle, generating a CT scan upon synchronization of the cardiac cycle with the trigger array, sweeping an electron beam



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along a target, and performing more than one such CT scans consecutively and beginning at different points within a time period of two or more cardiac cycles to construct a video display of the motion of the beating heart (col. 1 lines 11-15, col. 2 lines 2-41, col. 4 lines 8-28, col. 7 lines 58-67, col. 8 lines 1-21 lines 36-45 lines 58-67. Heuscher et al. do not explicitly disclose constructing a cine loop from said CT scans. It is well known in the art to use a cine loop imaging method to model portions of the beating heart at different points in the cardiac cycle on a video display. In the same field of endeavor, Sheehan et al. disclose a method for constructing cine angiography images of the heart using a CT scanner with the synchronization of data acquisition with the cardiac cycle with said data being acquired a plurality of times during a cardiac cycle and sweeping an electron beam along a target (abstract, col. 3 lines 1-19 lines 56-65, col. 7 lines 26-32, col. 9 lines 14-36, col. 10 lines 6-16). It would have therefore been obvious to one of ordinary skill in the art to use the cine CT imaging method teaching by Sheehan et al. to modify the teaching by Heuscher et al. for the purpose of displaying the series of CT scans on a video display into a three dimensional cine loop.

Regarding claim 20, the reference teaches the use of prospective gating (col. 8 lines 36-45 lines 60-67, col. 9 lines 1-3).

Regarding claims 21 and 22, the reference teaches moving the patient with respect to the CT scanner between or during the scans and further to obtain spiral scans (col. 3 lines 16-25).

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Regarding claim 23, the reference teaches the method of obtaining multiple parallel CT slices (col. 3 lines 37-48).

Regarding claims 25-27, 29, and 30, Heuscher et al. teach the method of obtaining cine angiography images with a computed tomography (CT) scanner. The reference teaches the method of monitoring the cardiac cycle of the patient, selecting an independently configurable trigger array or various trigger points along the cycle, synchronizing data acquisition with the cardiac cycle, generating a CT scan upon synchronization of the cardiac cycle with the trigger array, performing more than one such CT scans consecutively and beginning at different points within a time period of two or more cardiac cycles to construct a video display of the beating heart, and moving automatically the patient with respect to said CT scanner between or during at least two scans (col. 1 lines 11-15, col. 2 lines 2-41, col. 3 lines 16-25, col. 4 lines 8-28, col. 7 lines 58-67, col. 8 lines 1-21 lines 36-45 lines 58-67). Heuscher et al. do not explicitly disclose constructing a cine loop from said CT scans. It is well known in the art to use a cine loop imaging method to model portions of the beating heart at different points in the cardiac cycle on a video display. In the same field of endeavor, Sheehan et al. disclose a method for constructing cine angiography images of the heart using a CT scanner with the synchronization of data acquisition with the cardiac cycle with said data being acquired a plurality of times during a cardiac cycle (abstract, col. 3 lines 1-19 lines 56-65, col. 7 lines 26-32, col. 9 lines 14-36, col. 10 lines 6-16). It would have therefore been obvious to one of ordinary skill in the art to use the cine CT imaging method

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teaching by Sheehan et al. to modify the teaching by Heuscher et al. for the purpose of displaying the series of CT scans on a video display into a three dimensional cine loop.

Regarding claim 31, the reference teaches the method of prospective gating (col. 8 lines 36-45 lines 60-67, col. 9 lines 1-3).

Regarding claim 32, the reference teaches moving the patient with respect to the CT scanner between or during the scans and further to obtain spiral scans (col. 3 lines 16-25).

Regarding claim 33, the reference teaches the method of obtaining multiple parallel CT slices (col. 3 lines 37-48).

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Baisakhi Roy whose telephone number is 571-272-7139. The examiner can normally be reached on M-F (7:30 a.m. - 4p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

B.R.

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